We claim:

1. A method of providing humidity to an electrolyte membrane of a fuel cell, said membrane running between a cell anode area and a cell cathode area, comprising the step of exchanging humidity between fluid flowing from one of said anode and cathode areas to fluid flowing into said one of said anode and cathode areas.

2. The method according to claim 1, wherein said step of exchanging further comprises the steps of routing said fluid flowing from said one of said anode and cathode areas along an opposite side of a membrane to said fluid flowing into said one of said anode and cathode areas, said membrane being pervious to said humidity, such that said exchanged fluid passes through said membrane, and
further comprising the step of discharging said fluid flowing from one of said anode and cathode areas after said step of exchanging.

3. The method according to claim 2, wherein said fluid flowing from one of said anode and cathode areas and said fluid flowing into said one of said anode and cathode areas comprise one of a same, opposite, and cross-current-routed direction of flow.

4. The method according to claim 1, wherein said fuel cell comprises a plurality of fuel cells each comprising separate channels for accommodating flowing fluid, said plurality of fuel cells combine to form a fuel stack, and each of said plurality of fuel cells comprise a dehumidification unit.

5. The method according to claim 4, wherein a separate membrane section pervious to humidity is assigned to each cathode area of each of said plurality of fuel cells.

6. The method according to claim 2, wherein said fuel cell comprises a plurality of fuel cells each comprising separate channels for accommodating flowing fluid, said plurality of fuel cells combine to form a fuel stack, and each of said plurality of fuel cells comprise a dehumidification unit.

7. The method according to claim 6, wherein a separate membrane section pervious to humidity is assigned to each cathode area of each of said plurality of fuel cells.

8. The method according to claim 3, wherein said fuel cell comprises a plurality of fuel cells each comprising separate channels for accommodating flowing fluid, said plurality of fuel cells combine to form a fuel stack, and each of said plurality of fuel cells comprise a dehumidification unit.

9. The method according to claim 8, wherein a separate membrane section pervious to humidity is assigned to each cathode area of each of said plurality of fuel cells.

10. A fuel cell, comprising:

- a cathode area,
- an anode area,
- an electrolyte membrane;
- an inflow line for accommodating fluid to one of said cathode area and anode area,
- an outflow line for accommodating fluid from said one of said cathode area and anode area, and
- a humidity exchanger functionally associated with one of said cathode area and anode area and positioned along one of said inflow line and out flow line, said exchanger providing humidification of fluid supplied to said one of said cathode area and anode area.

11. The fuel cell according to claim 10, wherein said humidity exchanger comprises a humidifying and dehumidifying zone separated by a humidity pervious membrane, and wherein said inflow line is positioned in said humidifying zone and the outflow line is positioned in said dehumidifying zone.

12. The fuel cell according to claim 11, further comprising an electrolyte membrane, and said electrolyte membrane and said humidity pervious membranes comprise substantially similar materials.

13. The fuel cell according to claim 12, wherein said electrolyte membrane and said humidity pervious membrane combine to form different portions of a single membrane.

14. The fuel cell according to claim 10, further comprising a plurality of fuel cells combined to form a stack, wherein each of said plurality of fuel cells has a separate humidity exchanger connected to said cathode area of each of said plurality of fuel cells.

15. The fuel cell according to claim 14, wherein at least sections of one of said inflow and outflow lines of each of said plurality of fuel cells run through an adjacent one of said plurality of fuel cells.

16. The fuel cell according to claim 10, further comprising a plurality of fuel cells combined to form a stack, wherein each of said plurality of fuel cells has a separate humidity exchanger connected exclusively to a cathode area of each of said plurality of fuel cells.

17. The fuel cell according to claim 16, wherein at least sections of one of said inflow and outflow lines of each of said plurality of fuel cells run through an adjacent one of said plurality of fuel cells.

18. The fuel cell according to claim 11, further comprising a plurality of fuel cells combined to form a stack, wherein each of said plurality of fuel cells has a separate humidity exchanger connected exclusively to a cathode area of each of said plurality of fuel cells.

19. The fuel cell according to claim 18, wherein at least sections of one of said inflow and outflow lines of each of said plurality of fuel cells run through an adjacent one of said plurality of fuel cells.

20. The fuel cell according to claim 12, further comprising a plurality of fuel cells combined to form a stack, wherein each of said plurality of fuel cells has a separate humidity exchanger connected exclusively to a cathode area of each of said plurality of fuel cells.

21. The fuel cell according to claim 20, wherein at least sections of one of said inflow and outflow lines of each of said plurality of fuel cells run through an adjacent one of said plurality of fuel cells.

22. The fuel cell according to claim 13, further comprising a plurality of fuel cells combined to form a stack, wherein each of said plurality of fuel cells has a separate humidity exchanger connected exclusively to a cathode area of each of said plurality of fuel cells.

23. The fuel cell according to claim 22, wherein at least sections of one of said inflow and outflow lines of each of said plurality of fuel cells run through an adjacent one of said plurality of fuel cells.